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## Major Article

## Health care worker perspectives of their motivation to reduce health care–associated infections

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**Background:** Health care–associated infections (HAIs) are largely preventable, but are associated with considerable health care burden. Given the significant cost of HAIs, many health care institutions have implemented bundled interventions to reduce HAIs. These complex behavioral interventions require considerable effort; however, individual behaviors and motivations crucial to successful and sustained implementation have not been adequately assessed. We evaluated health care worker motivations to reduce HAIs.

**Methods:** This was a phenomenologic qualitative study of health care workers in different roles within a university hospital, recruited via a snowball strategy. Using constructs from the Consolidated Framework for Implementation Research model, face-to-face semi-structured interviews were used to explore perceptions of health care worker motivation to follow protocols on HAI prevention.

**Results:** Across all types of health care workers interviewed, patient safety and improvement in clinical outcomes were the major motivators to reducing HAIs. Other important motivators included collaborative environment that valued individual input, transparency and feedback at both organizational and individual levels, leadership involvement, and refresher trainings and workshops. We did not find policy, regulatory considerations, or financial penalties to be important motivators.

**Conclusions:** Health care workers perceived patient safety and clinical outcomes as the primary motivators to reduce HAI. Leadership engagement and data-driven interventions with frequent performance feedback were also identified as important facilitators of HAI prevention.

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Health care–associated infections (HAIs) affect almost 1 million patients each year and cause 75,000 deaths in the United States.<sup>1,2</sup> The Hospital-Acquired Condition (HAC) Reduction Program was established under Section 3008 of the Affordable Care Act with the goal of incentivizing hospital systems to reduce their incidence of HACs by reducing reimbursements to hospitals with HAC scores in the lowest-performing quartile in the nation.<sup>3</sup> In recent years, most health care institutions in the United States have implemented bundles of evidence-based behavioral interventions to reduce the major types of HAI: central line–associated bloodstream infection

(CLABSI), catheter-associated urinary tract infection (CAUTI), surgical site infection, methicillin-resistant *Staphylococcus aureus* bacteremia, and *Clostridium difficile* infection (CDI).<sup>3,4</sup> Cost of HAIs, including readmission and mortality rate, has been estimated at \$35.7 billion–\$45 billion per year, and per-patient cost ranges from \$5,000–\$50,000 per episode.<sup>5,6</sup>

HAIs are considered largely preventable.<sup>2</sup> A significant proportion can be avoided by adherence to evidence-based practices, such as handwashing, eliminating unnecessary use of medical devices, attention to insertion and maintenance protocols for devices, and consistent use of personal protective equipment. However, sustained adherence to the complex behavioral interventions necessary to reduce HAI can be challenging. Many barriers exist to high fidelity implementation of HAI prevention practices, including changes in organizational culture.<sup>7,8</sup>

A key factor affecting successful implementation of an intervention is the ability to achieve and sustain behavior modification of health care workers.<sup>9</sup> Highly motivated and engaged health care workers are crucial to the success of any infection prevention initiative. Understanding how individual behavior and motivation affect

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HAI prevention may provide insight into how to improve implementation efforts and overall success of these interventions.<sup>9</sup> However, there is a paucity of literature examining the motivation of health care workers to HAI prevention.

We therefore undertook a qualitative study to examine health care worker motivation for reducing HAI.

## METHODS

We applied the Consolidated Framework for Implementation Research (CFIR)<sup>10</sup> model to analyze motivation of health care workers for infection prevention. The CFIR was used to explore the relationships between domains, including characteristics of a particular intervention, outer setting (surrounding structure of an organization), and inner setting (framework around the process of implementation), that may facilitate or act as barriers to reducing HAI. As examples and to provide context, we cited the implementation efforts in CLABSI, CAUTI, and CDI prevention at our institution.

This study was considered a quality improvement project and was exempt from institutional review board approval.

### Study design

This was a phenomenologic qualitative study of interviews with key informant health care workers in different HAI prevention roles (eg, administrative, frontline patient care) in a large university hospital. Individual semi-structured face-to-face interviews were performed, with constructs from the CFIR guiding our questions, including outer and inner settings, and intervention characteristics. The intent was to allow open-ended responses to explore respondents' motivations related to infection prevention and perspectives of facilitators and barriers of HAI prevention bundle implementation.

### Setting and timing

The setting was a large academic research institution in Madison, Wisconsin, with 592 staffed beds and a level 1 trauma center. At the time of the study (July 2016), a bundle addressing prevention of CLABSI was in place as of August 2012, so the practice of this prevention protocol had been underway for nearly 4 years. A bundle addressing prevention of CAUTI was also in place with implementation start up in May 2015, so the practice of the CAUTI protocol had been underway for approximately 1 year. A bundle addressing CDI was implemented in September 2015, so the practice of this prevention protocol had been underway for approximately 10 months.

### Respondents

Respondents who were involved in the implementation of HAI prevention were recruited. These included nursing assistants, nurse champions, environmental service managers, trainee physicians, attending physicians, and physicians with administrative roles. Potential respondents were recruited by e-mail, and a snowball sampling strategy was used to identify additional potential respondents. Recruitment of new respondents and interviews were continued until theoretical saturation was reached.

### Data collection and analysis

Respondents were interviewed in or near their offices by 1 trained research team member so that every interviewee had the same interview experience, allowing us to standardize the interviewing process as much as possible.

The interviewer used structured open-ended and follow-up questions to explore respondents' familiarity with the implementation process of CAUTI, CLABSI, and CDI prevention bundles in the hospital; their views of the purpose of the interventions; and their motivations for personal compliance to the protocols. An outline of the interview guide has been attached as Appendix 1. Interviews were recorded and transcribed, and using multiple thorough readings, the primary interviewer reviewed the interviews to generate a list of concepts and themes that might not already be included in the list of constructs outlined by the CFIR model. Data were analyzed and coded using a thematic approach based on the CFIR model, including any novel themes that emerged during the multiple readings of the interviews.

## RESULTS

Of 15 individuals involved in HAI prevention who were asked to participate in the interview process, 5 people did not respond and 10 were interviewed (Table 1). Interviews were conducted in July 2016 and ranged in duration from 19-67 minutes. There were 6 physicians, 2 nurses, 1 nursing assistant, and 1 manager of environmental services, and the respondents came from a variety of departments, including internal medicine, critical care, hematology-oncology, general surgery, and orthopedic surgery. Three physicians held administrative roles, including 2 within quality improvement efforts in the hospital. Two physicians held HAI champion roles, including surgical site infection, CAUTI, and CLABSI, whereas 1 physician with an administrative role also held a champion role. The nursing personnel, including the nursing assistant, also held similar champion roles in CDI and CAUTI.

The most frequently discussed topics as categorized using the CFIR are subsequently discussed and summarized in Table 2.

### Patient needs and resources

Every respondent described patient safety and the desire for patients to have the best possible outcomes as their primary motivation for complying with HAI prevention protocols. Respondents further identified having organizational resources, quality measures, and hospital reimbursement as facilitators to patient safety, whereas lack of proper infection prevention training and leadership buy-in were identified as barriers.

### External policy and incentives

Eight respondents described a positive relationship between the enactment of the HAC Reduction Program legislation and bringing necessary attention to greater needs in HAI prevention. This increased focus on prevention by leadership allows greater resources to be allocated to the prevention of HAI, which leads to improvements in prevention efforts.

Few respondents, however, named the influence of external policies and financial consequences of poor performance as strong personal motivators.

**Table 1**  
Snowball recruitment timeline

	June 28, 2016	June 29, 2016	July 5, 2016	July 6, 2016	July 7, 2016	Total
Interviewees	6	1	2	5	1	15
No. of potential interviewees contacted	6	1	2	5	1	15
No. of responses	5	1	2	1	1	10

**Table 2**

Themes of motivations for implementing hospital-acquired infection prevention protocols according to qualitative analysis of interviews with health care workers

CFIR subconstruct	Subconstruct definition	Theme(s)	Representative quote(s)
Patient needs and resources	Recognizing and prioritizing "patient needs, as well as barriers and facilitators to meet those needs." <sup>11</sup>	Patient safety is primary motivation for prevention efforts.	"Even if I didn't have CMS penalizing me or telling me I had to do this, I'd want to do this because it's the best thing for the patients."
External policy and incentives → financial motivator	Involvement of "external strategies to spread interventions, including policy & regulations. . . external mandates, recommendations, etc." <sup>11</sup>	Benefit: policy brings attention to a greater need for infection prevention, allowing necessary resources to be allocated. Policy and finances not important personal motivators.	"Those regulations are what's responsible for motivating administration to help us. To give us the resources to do this. So they're very important."
Available resources	"The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time." <sup>11</sup>	Sufficient resources for some activities because of high prioritization of HAC prevention by leadership. Lack of resources, such as time, additional personnel, and sink access. Training could be improved.	"I think resources in the sense of financial things and supplies and things like that, we have sufficient resources." "Education is the biggest thing. The resources are there for the most part, it's just getting people to actually absorb them and implement them."
Goals, monitoring, and feedback	The perception of "the degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals." <sup>11</sup>	Closer monitoring of improvements made, in combination with greater personal feedback and data transparency, would provide greater motivation.	"From an individual standpoint and how we compare to say, all colorectal surgeons, as a group, that [feedback] we don't necessarily get yet. . . That would be useful."
Culture	"Norms, values, and basic assumptions of a given organization." <sup>11</sup>	The idea that the organization is "the best" motivates individuals to do their best.	"I think we take pride in being an organization that's the best, and we use new technologies, and we take pride in what we represent, and I think that's important."
Implementation climate	"The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, or expected in the organization." <sup>11</sup>	Information overload can be overwhelming and distracting. Collaborative, team-based environment helps with motivation to hold each other accountable.	"We just work also in an environment where everything is constantly changing. Nothing stays the same. So you can't be set in your ways about really anything. And if you're doing something this way, well you have to change it tomorrow because we have evidence that says this is a better way to do it, and so we do it that way. I mean I think change is hard, but I think we are all pretty flexible, and that has to be done, and that's just like the culture of a teaching hospital."
Leadership engagement	"Commitment, involvement, and accountability of leaders and managers with the implementation." <sup>11</sup>	Leadership has been great advocates for health care workers' needs when it comes to HAC prevention.	"They're very supportive of [HAC prevention interventions], and realize that they're important things, and they're driving it."
Evidence strength and quality	"Perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes." <sup>11</sup>	The strength of the evidence behind the bundle protocols is a strong motivator to comply. More data about specific progress would provide further motivation.	"Everyone's entitled to an opinion, but it's been researched, and it works, and we're going to do it because it works."

CFIR, Consolidated Framework for Implementation Research; CMS, Centers for Medicare &amp; Medicaid Services; HAC, hospital-acquired condition.

### Available resources

Respondents reported they had sufficient resources for the HAI prevention interventions because of the size and type of the institution, and because leadership highly prioritized and advocated for infection prevention.

Training as an available resource was mentioned by many respondents as an area for potential improvement. Respondents said that either there was no standardized training for these areas of infection prevention, or if there was they did not remember it, and there was a need for a more ongoing, standardized training approach that reached everyone. Respondents explained that most of their training in HAI prevention had been either experiential training, or information that they gleaned from reading the literature on the subject.

Other barriers to successful implementation of the interventions were discussed, such as lack of additional time for implementation efforts, a lack of adequate personnel resources for new interventions that may require additional support, and lack of access to sinks for handwashing for *C difficile* prevention.

### Goals, monitoring, and feedback

All respondents said that goals were clearly set and understood when it came to HAI prevention. However, respondents were unsure how progress was monitored toward achieving the goals,

and few felt they were made aware of feedback on their progress in a timely manner. Respondents explained that greater data transparency in a timely manner would be a strong motivator to increase their adherence to prevention protocols.

Few respondents also felt that they received any form of personal feedback, and felt that personal feedback about their HAI prevention activities would also be effective for motivating them to improve.

### Culture

Respondents talked about the standing of the institution as a leading academic research institution and how its strong reputation for being the best motivated them to try their best to live up to the expected standards.

### Implementation climate

Respondents discussed the pros and cons of the implementation climate working in a dynamic teaching hospital. Respondents explained tendency for "information overload" with new policies and constant changes in protocols.

However, because of the nature of it being a teaching hospital, respondents explained they were flexible and open to change when it comes to new interventions that have strong evidence to back up their success in achieving intended goals. Such interventions include

daily chlorhexidine bathing, which is relatively new and has strong evidence.

The respondents felt that the collaborative environment was encouraging in adhering to prevention interventions, and their input was listened to, which made them feel a part of the team and motivated them to further improve their prevention efforts.

#### *Leadership engagement*

Every respondent had positive responses when asked about the role of leadership in implementing HAC prevention protocols. They gave examples of support from leadership, and told stories of when leadership was accessible, advocated on team members' behalf, and helped gain access to more resources to achieve the desired outcome.

A physician leader in quality improvement initiatives described his leadership role in HAI prevention as advocacy for team members.

#### *Evidence strength and quality*

Respondents explained that there was a widely accepted perception of the strength of the evidence behind the protocols that were implemented and that this general knowledge of the strength of the evidence was an effective motivator for complying with the interventions.

Physician leadership emphasized the importance of having strong evidence behind implementation protocols by discussing personal experience where a lack of evidence led to a lack of the necessary motivation for intervention compliance.

Respondents discussed the theme of the importance of data transparency, not only regarding the literature supporting the interventions, but also in data regarding the hospital's progress, and it being a strong motivator for individual intervention adherence.

## DISCUSSION

We found that a desire to improve patient safety and clinical outcomes were the main motivators for health care workers toward reducing HAI. Our findings indicate that health care workers in mainly direct patient care roles perceived patient safety as a stronger personal motivator than institutional policies, regulations, or financial incentives. Furthermore, those who identified themselves as frontline health care workers with direct patient contact as faculty, nurses, and environmental service workers were likely to focus on improving the patient experience.

We found that respondents in patient care roles were motivated primarily by patient safety. Those in administrative roles also cited patient safety but included policies and financial reimbursements as motivators. These variations in health care worker motivation based on occupation and hierarchy structure<sup>9,12,13</sup> are essential for aligning expectations and improving compliance<sup>14</sup> with implementation efforts to reduce HAI.<sup>12</sup>

We identified additional important factors that may facilitate adherence to recommended infection control strategies. These included resource availability, leadership engagement, and participatory decision-making where health care workers perceive themselves to be in a collaborative environment that values individual input.

Prior studies corroborate our findings. For example, a study describing behavioral practice in infection control<sup>13</sup> surveyed nurses' responses to evaluate compliance with implementation of new policies to stop the recapping of needles in a large academic hospital with 1,350 patient beds. The findings demonstrate that compared with no or passive participation, compliance increased with active

participation. This supports our finding by showing increased satisfaction and productivity in environments that promote active participation of employees in decision-making processes.<sup>13</sup>

Engaged leadership can serve as a positive role model for health care workers. In a 2010 study,<sup>15</sup> Saint et al showed the importance of hospital leadership in HAI prevention using effective communication and interdisciplinary partnerships. Committed leadership provides opportunity to interact with employees and gain understanding of strategies that may help with implementation of policies and procedures.<sup>16-18</sup>

We found that there are additional opportunities to support HAI reduction efforts.<sup>9</sup> Such opportunities may include resolving barriers which impede efforts to reduce HAI. Such barriers include lack of focused trainings and refresher workshops, information overload, and poor access to transparent and timely performance feedback at both organizational and individual levels. Tailored trainings may include regular updates on antimicrobial stewardships, appropriate use of medical devices, and universal precautions, such as hand hygiene. Information technology can also facilitate timely access to data and improve real-time performance feedback.

Our study has limitations. First, its findings may not be generalizable given the relatively small respondent sample size from a single institution. However, we included a heterogeneous group of health care workers, such as physicians, nurses, a nursing assistant, and environmental service personnel, to get multiple perspectives. Second, this was a study of self-reported motivation, and we did not undertake direct observations of health care worker behavior to correlate perceptions with practices. Third, self-selection bias may account for the possibility that motivation may differ among staff with or without champion roles. Fourth, given the small sample size, we did not stratify by respondent occupation, nor examine dynamics between respondents' professional groups. Finally, social desirability bias may be a concern in studies eliciting data on behaviors of best practices. We attempted to mitigate this bias by conducting 1-on-1 interviews rather than focus groups to allow health care workers to become more comfortable discussing their practices.

In conclusion, patient safety and improved outcomes are powerful motivators for health care workers to reduce HAIs. Institutional bundles and policies are important but need to be supplemented with transparency in data, feedback, and adequate training of health care workers. Although information overload and lack of resources, such as time and personnel, are additional barriers that should be addressed, a team-based environment can enhance collaboration, including health care leadership and those at the frontline of patient care.

Although our objective did not specifically evaluate the impacts of infection prevention bundles, we believe our study findings may not only help to understand personal or organizations motivators, but may shed some light on how to implement and sustain evidence-based behavioral infection prevention bundles. Our study provides useful data to inform the design and implementation of interventions to increase adherence for infection prevention practices by health care workers and health care institutions.

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